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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,331	02/28/2002	Nicolas Louis Bouchon	13918	5628

7590 03/29/2004

Ralph A. Dowell
Dowell & Dowell, P.C.
Suite 309
1215 Jefferson Davis Hwy.
Arlington, VA 22202

EXAMINER	
RIOS CUEVAS, ROBERTO JOSE	
ART UNIT	**PAPER NUMBER**
2836	

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/084,331	BOUCHON, NICOLAS LOUIS	
	Examiner	Art Unit	
	Roberto J Rios	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-101* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-101* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02/2/2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/28/02; 7/31/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-10, 23-33, 46-62, 69-73, 76-79, 83-87, 91-95 and 99 are rejected under 35 U.S.C. 102(e) as being anticipated by Gruenwald et al (US patent 6,484,830).

As per claims 74 and 75, Gruenwald et al (herein after Gruenwald) teach a computer readable medium providing signals including codes segments for directing a processor circuit to control power supplied by an energy generating device to an energy bus in: communication with the energy generating device and with a regenerative braking system in a hybrid electric vehicle, in response to a braking signal indicative of user brake actuation (Figure 5; col. 8, line 6).

As per claims 100 and 101, Gruenwald teaches a computer readable medium providing signals including codes segments for directing a processor circuit to control energy contributions onto an energy bus in a hybrid electric vehicle from an energy generating device and from a regenerative braking system respectively, to prevent said contributions from exceeding a desired total energy contribution (Figure 5; col. 8, line 6).

As per claims 1 and 24, Gruenwald teaches a method and an apparatus for supplying energy to an energy bus in communication with an energy-generating device

(12) and with a regenerative braking system (18) in a hybrid electric vehicle, the apparatus comprising a processor circuit configured to control power supplied by the energy generating device to the energy bus, in response to a braking signal indicative of user brake actuation (Figure 5; col. 8, line 6).

As per claims 2 and 25, Gruenwald teaches said processor circuit being configured to control said power by controlling power supplied by an auxiliary power unit (12) of the vehicle.

As per claims 3 and 26, Gruenwald teaches said processor circuit being configured to control said power by controlling a current supplied by a generator (col. 8, line 6).

As per claims 4 and 27, Gruenwald teaches that the current-controlled APU could be a fuel cell (col. 4, line 41).

As per claims 5 and 28, Gruenwald teaches said processor circuit being configured to commence said controlling no later than a time at which the regenerative braking system of the vehicle commences supplying energy to the energy bus (col. 8, line 6).

As per claims 6 and 29, Gruenwald teaches said processor circuit being configured to control said power by reducing said power supplied by the energy generating device to the energy bus (col. 8, line 6).

As per claims 7 and 30, Gruenwald teaches said processor circuit being configured to increase power supplied by a regenerative braking system of the vehicle

to the energy bus, while reducing said power supplied by the energy generating device to the energy bus (col. 8, line 6).

As per claims 8 and 31, Gruenwald teaches said processor circuit being configured to increase a regenerative braking torque applied by the regenerative braking system until a desired regenerative braking torque is achieved (col. 8, line 6).

As per claims 9 and 32, Gruenwald teaches said processor circuit being configured to identify a total desired braking torque in response to the braking signal (col. 8, line 6).

As per claims 10 and 33, Gruenwald teaches said processor circuit being configured to identify a maximum available regenerative braking torque (col. 8, line 6).

As per claims 23 and 46, Gruenwald teaches said processor circuit being configured to control energy contributions onto the energy bus from the energy generating device and from a regenerative braking system of the vehicle respectively, to prevent said contributions from exceeding a desired total energy contribution (col. 8, line 6).

As per claim 47, Gruenwald teaches a system comprising the claimed apparatus and further comprising the energy-generating device, said energy generating device being in communication with said processor circuit and with the energy bus (Figure 1).

As per claim 48, Gruenwald teaches said energy generating device comprising an auxiliary power unit (12) of the vehicle.

As per claim 49, Gruenwald teaches said APU comprises a generator (28).

As per claim 50, Gruenwald teaches said APU comprises a fuel cell (col. 4, line 41).

As per claim 51, Gruenwald teaches the system further comprising the energy bus (Figure 1).

As per claim 52, Gruenwald teaches the system further comprising the regenerative braking system, the regenerative braking system being in communication with said processor circuit and with the energy bus (Figure 1).

As per claim 53, Gruenwald teaches said processor circuit being configured to increase power supplied by said regenerative braking system to the energy bus, while reducing said power supplied by said energy generating device to the energy bus (col. 8, line 6).

As per claim 54, Gruenwald teaches an energy storage system (20) in communication with the energy bus.

As per claim 55, Gruenwald teaches an apparatus for supplying energy to an energy bus in communication with energy generating means and with regenerative braking means in a hybrid electric vehicle, the apparatus comprising means for receiving a braking signal indicative of user brake actuation; and means for controlling power supplied by the energy generating means to the energy bus, in response to the braking signal (Figure 5; col. 8, line 6).

As per claim 56, Gruenwald teaches said means for controlling power comprising means for controlling power supplied by an auxiliary power unit (APU) of the vehicle (col. 8, line 6).

As per claim 57, Gruenwald teaches said means for controlling comprising means for commencing said controlling no later than a time at which the regenerative braking means of the vehicle commences supplying energy to the energy bus (col. 8, line 6).

As per claim 58, Gruenwald teaches said means for controlling comprising means for reducing said power supplied by the energy generating means to the energy bus (col. 8, line 6).

As per claim 59, Gruenwald teaches comprising means for increasing power supplied by a regenerative braking means of the vehicle to the energy bus, while said means for reducing is reducing the power supplied by the energy generating means to the energy bus (col. 8, line 6).

As per claim 60, Gruenwald teaches said means for increasing power comprising means for increasing a regenerative braking torque applied by the regenerative braking means until a desired regenerative braking torque is achieved (col. 8, line 6).

As per claim 61, Gruenwald teaches means for identifying a total desired braking torque in response to the braking signal (col. 8, line 6).

As per claim 62, Gruenwald teaches means for identifying a maximum available regenerative braking torque (col. 8, line 6).

As per claim 70, Gruenwald teaches a system comprising the claimed apparatus and further comprising said energy generating means for generating said power supplied by said energy generating means to the energy bus, said energy generating

means being in communication with said means for reducing power and with the energy bus (Figure 1; col. 8, line 6).

As per claim 71, Gruenwald teaches said energy generating means comprising an auxiliary power unit (12) of the vehicle.

As per claim 72, Gruenwald teaches the system further comprising the regenerative braking means (18) for regeneratively braking the vehicle, said regenerative braking means being in communication with the energy bus (Figure 1).

As per claim 73, Gruenwald teaches an energy storage means (20) for storing energy, in communication with the energy bus.

As per claims 76 and 84, Gruenwald teaches a method and an apparatus for supplying energy to an energy bus in a hybrid electric vehicle, the apparatus comprising a processor circuit configured to control energy contributions onto the energy bus from an energy generating device and from a regenerative braking system respectively, to prevent said contributions from exceeding a desired total energy contribution (Figure 1; col. 8, line 6).

As per claims 77 and 85, Gruenwald teaches said processor circuit being configured to reduce power supplied by the energy generating device to the energy bus (col. 8, line 6).

As per claims 78 and 86, Gruenwald teaches said processor circuit being configured to reduce power supplied by the energy generating device to the energy bus, while increasing power supplied by the regenerative braking system to the energy bus (col. 8, line 6).

As per claims 79 and 87, Gruenwald teaches said processor circuit being configured to increase a regenerative braking torque applied by the regenerative braking system until a desired regenerative braking torque is achieved (col. 8, line 6).

As per claims 83 and 91, Gruenwald teaches said processor circuit being configured to control power supplied by the energy generating device to the energy bus, in response to a braking signal indicative of user brake actuation (col. 8, line 6).

As per claims 69 and 92, Gruenwald teaches an apparatus for supplying energy to an energy bus in a hybrid electric vehicle, the apparatus comprising: first means for controlling a first energy contribution onto the energy bus from energy generating means; and second means for controlling a second energy contribution onto the energy bus from regenerative braking means, wherein said first and second means for controlling cooperate to prevent said contributions from exceeding a desired total energy contribution (Figure 1; col. 8, line 6).

As per claim 93, Gruenwald teaches said first means for controlling comprising means for reducing power supplied by the energy generating means to the energy bus (col. 8, line 6).

As per claim 94, Gruenwald teaches said second means for controlling comprising means for increasing power supplied by the regenerative braking means to the energy bus, and wherein said first means for controlling comprises means for reducing power supplied by the energy generating means to the energy bus, while said second means for controlling is increasing said power supplied by the regenerative braking means (col. 8, line).

As per claim 95, Gruenwald teaches said means for increasing power comprises means for increasing a regenerative braking torque applied by the regenerative braking means until a desired regenerative braking torque is achieved (col. 8, line 6).

As per claim 99, Gruenwald teaches said first means for controlling comprising means for reducing power supplied by the energy generating means to the energy bus, in response to a braking signal indicative of user brake actuation (col. 8, line 6).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 11-22, 34-45, 63-68, 80-82, 88-90 and 96-98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruenwald in view of Kade et al (5,511,859).

As per claims 11, 34, 63, 80, 88 and 96, Gruenwald teaches identifying a total desired braking torque and a maximum available regenerative braking torque. Gruenwald further teaches that if more braking action is required that is available form the regenerative braking means, friction brakes will be applied to supplement the deceleration event until the vehicle is stopped but does not specifically disclose identifying a maximum desired regenerative torque. However, Kade et al (herein after Kade) teach a hybrid vehicle comprising a regenerative and friction brake blend control system, wherein a maximum desired regenerative braking torque is identified, in

response to a total desired braking torque and a maximum available regenerative braking torque (col. 3, lines 25-53; col. 5, line 58+).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Gruenwald's braking system with Kade's friction/regenerative blend control for the purpose of supplementing the regenerative braking system.

As per claims 12 and 35, Kade teaches said processor circuit being configured to set said maximum desired regenerative braking torque equal to the lesser of: (a) said total desired braking torque; (b) said maximum available regenerative braking torque; and (c) a torque equivalent of a desired current drain from the energy bus, said desired current drain comprising a desired charging current for charging an energy storage system (ESS) in communication with the energy bus (col. 5, line 58-col. 6, line 35).

As per claims 13 and 36, Kade teaches said processor circuit being configured to identify, as said desired charging current, a maximum allowable charging current for charging the ESS (col. 6, line 23).

As per claims 14, 37, 64, 81, 89 and 97, Gruenwald teaches said processor circuit being configured to control said power by setting a desired power output of the energy generating device, in response to a regenerative braking torque but does not specifically disclose in response to a maximum desired regenerative braking torque. However, Kade teaches determining a maximum desired braking torque to be

supplemented by friction braking in order to maintain a desired bus power/voltage (col. 5, line 58-col. 6, line 35).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Gruenwald's regenerative braking control with Kade's friction/regenerative blend control for the purpose of supplementing the regenerative braking system while ensuring a desired bus power/voltage.

As per claims 15, 38 and 65, Gruenwald teaches said processor circuit being configured to set said desired power output by setting a desired current level of an auxiliary power unit (12) of the vehicle (col. 8, line 6).

As per claims 16 and 39, Gruenwald in view of Kade teaches said processor circuit being configured to set said desired current level of the APU equal to the lesser of: (a) a present desired current level of the APU; and (b) a desired current drain from the energy bus comprising a desired charging current for charging an energy storage system (ESS) in communication with the energy bus, minus a current equivalent of said maximum desired regenerative braking torque (col. 8, line 6).

As per claims 17 and 40, Gruenwald teaches said processor circuit being configured to identify, as said desired charging current, a maximum allowable charging current for charging the ESS (col. 8, line 6).

As per claims 18, 41, 66, 82, 90 and 98, Gruenwald teaches said processor circuit being configured to set a present desired regenerative braking torque of a regenerative braking system of the vehicle, in response to the maximum regenerative braking torque and the power supplied by the energy generating device to the energy

bus but does not specifically disclose being in response to the maximum desired regenerative braking torque. However, Kade teaches setting a desired regenerative braking torque in response to the maximum desired regenerative braking torque (col. 5, line 58+).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Gruenwald's regenerative braking control with Kade's friction/regenerative blend control for the purpose of supplementing the regenerative braking system while ensuring a desired bus power/voltage.

As per claims 19 and 42, Kade teaches said processor circuit being configured to set said present desired regenerative braking torque equal to the lesser of: (a) said maximum desired regenerative braking torque; and (b) a torque equivalent of (i) a desired current drain from the energy bus, said desired current drain comprising a desired charging current for charging an energy storage system in communication with the energy bus; minus (ii) an actual current supplied by the energy generating device to the energy bus (col. 5, line 58-col. 6, line 35).

As per claims 20 and 43, Kade teaches said processor circuit being configured to identify, as said desired charging current, a maximum allowable charging current for charging the ESS (col. 6, line 23).

As per claims 21, 44 and 67, Gruenwald teaches said processor circuit being configured to set a friction braking torque of a friction braking system of the vehicle (col. 8, line 18).

As per claims 22, 45 and 68, Gruenwald teaches said processor circuit being configured to set said friction-braking torque but does not specifically disclose being equal to a difference between the present desired regenerative braking torque and the total desired braking torque. However, Kade teaches a regenerative and friction brake blend control, wherein a friction-braking torque is set being equal to a difference between a present desired regenerative braking torque and the total desired braking torque (col. 3, line 48).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Gruenwald's regenerative braking control with Kade's friction/regenerative blend control for the purpose of supplementing the regenerative braking system while ensuring a desired bus power/voltage.

5. Art of general nature relating to hybrid electric vehicles has been cited for applicant's review.

Communication with PTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberto Rios whose telephone number is (571) 272-2056. In the event that Examiner Rios cannot be reached, his supervisor, Brian Sircus may be contacted at (571) 272-2800, ext. 36. The fax number for Before-Final communications and After-Final communications is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BRIAN SIRCUS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Roberto J. Rios
Patent Examiner